A low noise CsI detector array for the precision measurement of parity nonconservation in $\vec{n} + p \rightarrow d + \gamma$

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The NPDGamma collaboration has constructed an apparatus to measure with a small uncertainty the size of the pion-nucleon coupling constant in the parity non conserving pion exchange weak potential for N-N interactions. This coupling constant is directly proportional to the parity violating up-down asymmetry in the angular distribution of 2.2 MeV gamma rays with respect to the neutron spin direction in the reaction where polarized cold neutrons are captured by para-hydrogen. The asymmetry has a predicted size of 5×10^{-8} and we will measure it to 30%. For this purpose,a low noise, current mode, CsI detector array has been constructed and tested. The beam commissioning of the detector will start in early 2004 in the new flight path 12 at the LANSCE spallation source. We will describe the detector and show test results.

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